



# Bank Trends

**Analysis of  
Emerging Risks  
In Banking**

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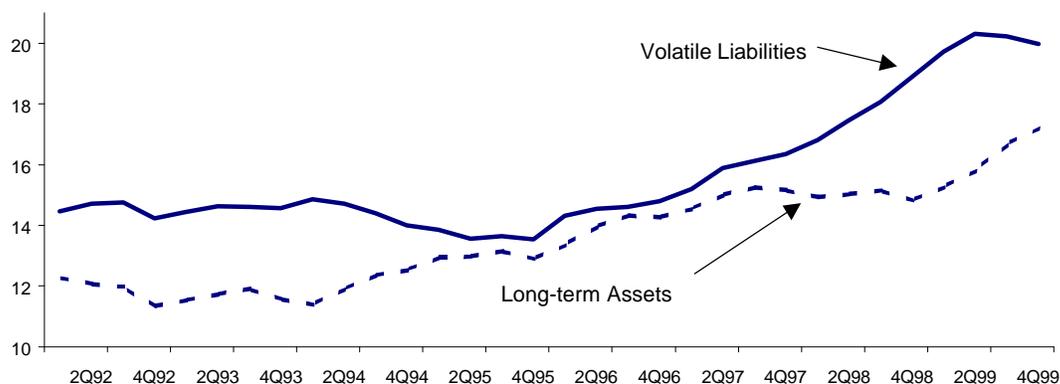
## Increasing Interest Rate Risk at Community Banks and Thrifts

*There are indications that the community banking and thrift industry's vulnerability to interest rate risk (IRR) is increasing. Over the past several years, the average maturity of assets at banks and thrifts has extended. During the same time, volatile liabilities have been growing, strengthening the link between bank funding costs and market interest rates. Together, these trends suggest that industry earnings and equity values are increasingly at risk to rising interest rates. The Office of Thrift Supervision (OTS) has noted several consecutive quarters of rising IRR at thrifts, and Olson Research Associates (Olson), an IRR consulting firm serving mostly community banks, has also noted increasing IRR among its clients and other banks that it monitors. Moreover, wide swap spreads and the expectation of new derivatives accounting may have discouraged some banks from purchasing interest rate protection before rates rose in 1999. With rates having risen recently, community bank and thrift net interest margins (NIMs) may come under pressure.*

**Chart 1**

**Volatile Liabilities and Long-term Assets Have Been Growing as a Percent of Assets for Community Banks**

As a Percent of Total Assets

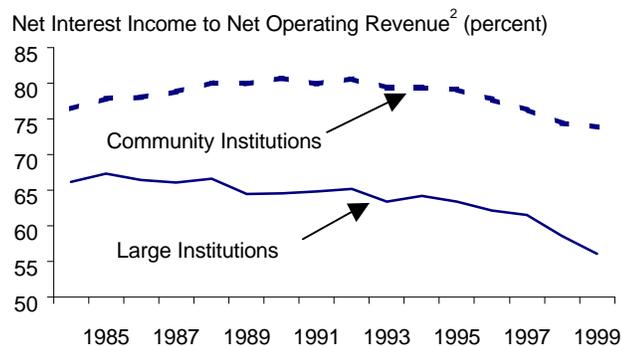


Source: Call Reports, Research Information System

## Increasing Interest Rate Risk at Community Banks and Thrifts

**Chart 2**

Community Institutions<sup>1</sup> Rely More on Spread Revenue than Large Institutions Do



<sup>1</sup>Banks and Thrifts with less than \$1 Billion in Assets

<sup>2</sup>Net operating revenue is net interest income plus noninterest income

Source: Call Reports, Research Information Systems

Although eliminating IRR completely is difficult, and not wholly desirable, excessive levels of IRR can jeopardize the stability of earnings and capital levels of insured institutions.

The importance of IRR relates to the banking industry's reliance on net interest income. Net interest income, or revenues generated by the spread earned from funding loans and securities with deposits or borrowings, is a core income source for most depository institutions. This is particularly true of community institutions, which continue to derive almost 74 percent of net operating revenue<sup>2</sup> from net interest income. As shown in Chart 2, community institutions derive a significantly higher portion of total revenue from net interest income than do large institutions.<sup>3</sup>

### Introduction

Banks may face market risks from exposures to interest rates, foreign exchange, commodities, or equities. For most FDIC-insured institutions, IRR is the prevalent market risk. IRR in general is the potential for changes in interest rates to reduce a bank or thrift's earnings or economic value. The risk arises as a normal part of financial intermediation as institutions fund loans and securities with deposits or other borrowings. Mismatches in the term, rate structures, and optionality of an institution's assets and liabilities are the primary sources of IRR.<sup>1</sup>

<sup>1</sup> These risks often are referred to as repricing, basis, and options risks. Repricing risk refers to the potential for interest-sensitive assets and liabilities to reprice at different time intervals in response to interest rate changes. Basis risk refers to potential changes in the relationship between interest rate indices on different financial instruments. Options risk refers to the early repricing of assets or liabilities (e.g., mortgage prepayments or early deposit withdrawals) as a result of options embedded in customer contracts.

The thrift industry of the 1980s exemplifies the adverse effects of excessive levels of IRR. Many analysts considered IRR a significant contributing factor to many thrift failures after deposit rate ceilings were lifted in the early 1980s. According to studies, thrifts could have been more profitable in the early 1980s and thrift failures would have been greatly reduced if they had managed their interest rate risk exposure better.<sup>4</sup> The thrift industry was heavily concentrated in long-term assets because of its

<sup>2</sup> Net operating revenue is interest income less interest expense plus noninterest income.

<sup>3</sup> Community banks and thrifts are those with less than \$1 billion in assets. Large institutions are those with more than \$1 billion in assets.

<sup>4</sup> For example see: James R. Barth, 1991. *The Great Savings and Loan Debacle*. The AEI press, Or, Alan C. Hess, "Could Thrifts be Profitable? Theoretical and Empirical Evidence," *Carnegie-Rochester Conference Series on Public Policy*, Amsterdam; Spring 1987.

residential mortgage lending focus. Once thrifts had to pay competitive rates on deposits, NIMs were squeezed because the long-term nature of their earning assets caused interest income to increase more slowly than interest expense. Indirectly, the upward pressure on the cost of funds affected more than NIMs because it enticed thrift managers farther down the risk spectrum in search of higher-yielding assets.

Since the 1980s, supervisory oversight of IRR has increased substantially. In 1989, the Federal Home Loan Bank Board instituted *Thrift Bulletin 13*, which outlines the responsibilities of thrift managers with regard to IRR and mandates that thrifts set limits on the sensitivity of the market value of portfolio equity (MVPE) to changes in interest rates. During 1996, the three federal banking agencies issued a *Joint Agency Policy Statement on Interest Rate Risk*, which outlines principles and practices for effectively identifying, measuring, monitoring, and controlling IRR.<sup>5</sup> The federal thrift and banking regulators also adopted a revised Uniform Financial Institutions Rating System (UFIRS), which was amended to include sensitivity to market risk, “S,” as a sixth component in addition to capital, assets, management, earnings, and liquidity (CAMEL). Examiners use the “S” component to rate the degree of market risk; management's ability to identify, measure, monitor, and control market risk; and the financial support provided by earnings and capital.

This paper discusses the relative levels of IRR that have existed historically at banks and thrifts. It surveys the recent trends in IRR levels at thrifts reported by the OTS, and it discusses balance sheet trends that appear to be leading to higher levels of IRR at community banks. Generalizations about IRR levels at banks are difficult because banks report significantly less information than thrifts and the individual circumstances of banks vary greatly. However, in order to convey the implications of balance sheet changes at community banks, this paper discusses the trend in the level of IRR at community banks reported by Olson. It also compares estimates of current levels of IRR at banks reported by Olson with those of thrifts reported by the OTS. Finally, it

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<sup>5</sup> For the full text of the interagency statement, see the website <http://www.fdic.gov/news/news/financial/1996/fi19652a.html>

discusses trends in IRR management practices at banks.

## Evidence of Rising Interest Rate Sensitivity

**Balance Sheet Trends.** The mortgage lending emphasis of thrifts traditionally has made them more interest rate sensitive than banks. In a 1996 study,<sup>6</sup> the Federal Reserve Board (FRB) found that most banks and thrifts are exposed to rising rates (they are liability sensitive). However, thrifts displayed markedly more exposure than commercial banks to changes in interest rates because of higher concentrations in mortgages and mortgage-backed securities.<sup>7</sup> At midyear 1995, the estimated median decline in economic value for thrifts, given a 200-basis-point parallel rise in rates, measured 2.0 percent of total assets,<sup>8</sup> more than 60 times higher than the comparable measure for commercial banks. At the extremes, the worst 5 percent of thrifts had exposures double those of the worst 5 percent of all commercial banks. Another important conclusion of this study is that the authors suggest that a relatively simple IRR model based on Call Report data, “can be useful for broadly measuring the IRR exposure of institutions that do not have unusual or complex asset characteristics.”<sup>9</sup>

The IRR associated with the mortgage lending activities of thrifts exemplified in the FRB study

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<sup>6</sup> D.M. Wright and J.V. Houpt, Federal Reserve Board, “An Analysis of Commercial Bank Exposure to Interest Rate Risk,” *Federal Reserve Bulletin*, February 1996, p. 115.

<sup>7</sup> Mortgage-related assets tend to have significant IRR because of their long maturity and embedded prepayment options. While mortgage holders bear the risk of price depreciation if rates rise, they do not necessarily benefit from the upside potential of price appreciation if rates fall because of the borrower's option to refinance the mortgage.

<sup>8</sup> The net position is defined as the decline in the economic value (sometimes called market value of portfolio equity or net portfolio value) for a 200-basis-point change in rates expressed as a percentage of total assets.

<sup>9</sup> Wright and Houpt (1996) compares the results for over 1,400 thrifts generated by a simplified model with the results generated by the more sophisticated OTS model on the same institutions. The study found that the basic model performed well relative to the more complex model in placing an institution along the risk exposure spectrum.

rationalizes the increased reporting requirements for thrifts that have existed since 1989. Through the thrift financial report, thrifts report substantial data related to the average life and repricing characteristics of their assets and liabilities.<sup>10</sup> These data are used to generate quarterly IRR reports on the thrift industry. From this report, the trends in the level of IRR at thrifts are monitored off-site and higher-risk thrifts are subject to heightened OTS supervision. The markedly lower IRR displayed by banks in studies such as the *1996 Fed study* may explain why bank IRR reporting and monitoring have been less extensive.

Recently, however, the balance sheet structure of commercial banks has changed in ways that may warrant increased IRR-related concern. First, owing mostly to increased long-term mortgage holdings, asset maturities are lengthening. As a result, the percentage of commercial bank assets that mature or reprice in more than 5 years (long-term assets) has been rising (Cover, Chart 1).

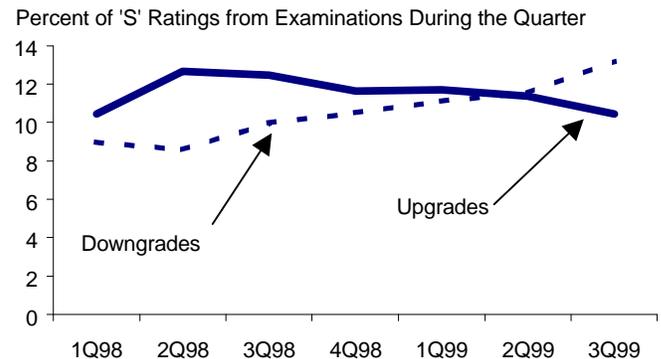
Second, the commercial banking industry appears to be relying more on potentially volatile funding sources. As displayed in Chart 1, potentially volatile liabilities<sup>11</sup> increased from almost 14 percent to almost 20 percent of community bank assets from the first quarter of 1995 to year-end 1999.

*The lengthening of asset maturities and the increasing use of volatile funding sources at commercial banks may have increased the vulnerability of industry earnings and capital to rising interest rates.* According to the *1996 Fed study*, most banks and thrifts were liability sensitive at that time. Balance sheet trends since then have likely increased banks liability sensitivity for the following reasons:

- Longer asset maturities increase asset duration.<sup>12</sup>
- In addition, in many cases, greater use of more volatile funding sources, which typically mature or reprice at shorter intervals, tends to decrease the duration of liabilities.
- The combination of these trends increases the duration gap and places a bank's NIM at risk to rising rates, because the increase in the duration mismatch implies that liabilities will reprice upward at a faster rate than assets will.

**Supervisory Assessments of Market Sensitivity.** Examiners are beginning to express heightened concern for IRR through the ratings process. Although most institutions examined in 1999 received one of the two highest "S" ratings,<sup>13</sup> as shown in Chart 3, the percentage of downgrades in the "S" component at examinations completed during the second and third quarters of 1999 exceeded the percentage of upgrades.

**Chart 3**  
The Percentage of 'S' Downgrades Recently Began Exceeding Upgrades



Source: Examination data

<sup>10</sup> Thrifts are required by *Thrift Bulletin 13* to set limits on their MVPE. Most fulfill the measurement aspect of this requirement by reporting the necessary information for the OTS to calculate the MVPE.

<sup>11</sup> Volatile liabilities consist of Federal funds purchased and securities sold under agreements to repurchase; demand notes issued to the U.S. Treasury and other borrowed money (since March 1997 also includes mortgage indebtedness and obligations under capitalized leases); time deposits of \$100,000 or more held in domestic offices; foreign office deposits; and trading liabilities less trading liabilities revaluation losses on interest rate, foreign exchange rate, and other commodity and equity contracts.

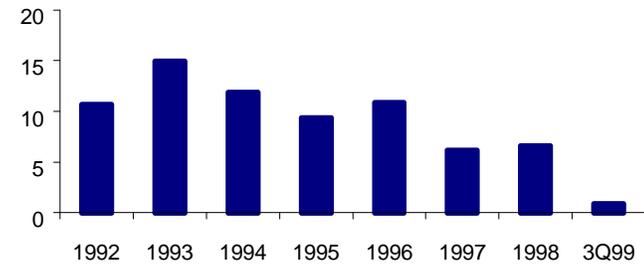
<sup>12</sup> Duration is used here synonymously with interest rate elasticity (IRE). IRE, or duration, is a measure of interest rate sensitivity representing the expected percentage change in the value of a financial instrument, given a 100-basis-point change in interest rates. All else being equal, the longer a financial instrument's maturity, the higher the IRE. IRE approximates Macaulay's duration, which is the present value weighted average time until all cash flows from a financial instrument will be received or repriced to current market rates. As a measure of Macaulay's duration, the IRE percentage is used to express the number of years to receive or reprice cash flows.

<sup>13</sup> Almost 94 percent of institution examined in 1999 received an "S" rating of "1" or "2."

**Chart 4**

The One-Year Gap Ratio\* for the Top 50 Banking Companies, Though Falling, Remains Positive

\*The difference between asset and liabilities repricing in 1 year or less to total assets



\* The difference between assets and liabilities repricing in 1 year of less to total assets

Source: SNL Securities Datasource

## Industry Models of Interest Rate Sensitivity

**Large Commercial Banks.** Levels of IRR at large institutions are difficult to assess offsite because of the complexity of their balance sheets and the sophistication of their activities. However, as shown in Chart 4, the median 1-year gap ratio<sup>14</sup> for the top 50 bank holding companies, while declining, is still positive. Although a simplistic measure, the median ratio for these companies does imply that most of the largest banking organizations' NIMs would not be impaired by a rise in interest rates. Furthermore, large institutions typically use complex models to estimate the potential earnings effects of various interest rate scenarios. In general, public filings of the top 25 banking organizations disclose little sensitivity to changes in interest rates as measured by the companies' internal models.

**Thrifts.** According to the OTS, interest rate sensitivity at thrifts has been increasing. During the fourth quarter of 1999, the thrift industry's median interest rate sensitivity measure rose for the fifth consecutive quarter to its highest level since the OTS instituted its current IRR model in 1992.<sup>15</sup> This sensitivity measure represents the median basis point

<sup>14</sup> The difference between assets and liabilities repricing in one year or less divided by total assets.

<sup>15</sup> Office of Thrift Supervision, *Quarterly Review of Interest Rate Risk*, Third Quarter 1999 Highlights.

decline in the ratio of MVPE<sup>16</sup> to the present value of assets resulting from a 200-basis-point change in interest rates. The increase in sensitivity over the past five quarters is attributed to rising interest rates and an increase in asset duration associated with the increased holdings of 30-year fixed-rate mortgages.

**Community Banks.** According to Olson Research Associates (Olson), IRR at community banks has increased significantly. Olson uses Call Report and other information gathered from community banks to estimate interest rate risk for more than 1,300 mostly community banks, ranging in size from \$10 million to \$8.5 billion.<sup>17</sup> While there are limitations to estimating the magnitude of IRR based on Call Report information, Olson's model is useful for noting that community banks are exposed to rising interest rates and that this exposure is increasing.

According to Olson, the value of loans and securities has been falling at a faster rate than the economic value of deposits and other liabilities since the first quarter of 1999 for the institutions they monitor. As of March 31, 1999, Olson's longer-term measure of IRR<sup>18</sup> indicated the highest exposure to rising rates since they started collecting data in 1995. After falling some in the second quarter of 1999, the ratio rose in both the third and fourth quarter of 1999, continuing the longer-term trend.

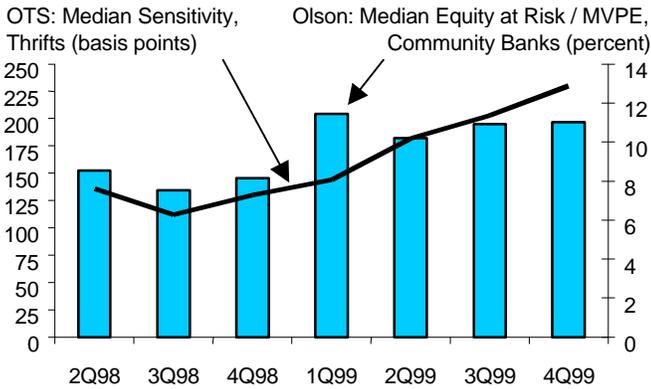
<sup>16</sup> Market value of portfolio equity (MVPE) or net portfolio value (NPV) is the present value of assets less the present value of liabilities. The longer-term effect of the gap in the duration of assets and liabilities is commonly evaluated by estimating the MVPE or NPV and subjecting this valuation to a shock in interest rates. The present value of assets and liabilities is derived by estimating the cash flows to be generated by the instruments and discounting them at appropriate market rates.

<sup>17</sup> "A/L Benchmarks Industry Report," Olson Research Associates Inc., First Quarter 1999. Olson's sampling of more than 1,100 banks is intended to represent all community banks. According to Ronald Olson, the company does not model only its own clients; it also randomly selects and adds other banks in each of three peer groups (by size) until adding banks fails to significantly change the model's output measures in each peer group.

<sup>18</sup> Measured by equity value at risk or change in the MVPE from a 200-basis-point parallel change in the yield curve, as a percentage of MVPE.

**Chart 5**

Interest Rate Risk Is Rising at Community Banks and Thrifts



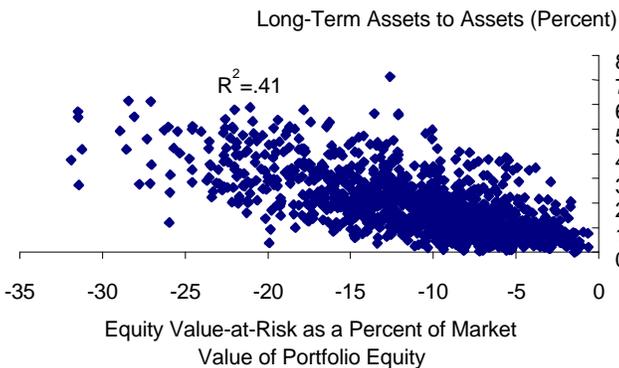
Source: Olson Research Associates, Office of Thrift Supervision

Chart 5 shows the recent trend for community banks and thrifts and their respective measures of longer-term IRR. Both the OTS and Olson measure depicted in Chart 5 involve the concept of equity at risk, or a long-term view of IRR as opposed to earnings at risk, or a short-term view of IRR. Olson's measures of earnings at risk for community banks had not risen as consistently as the equity measures until the fourth quarter of 1999. The differences between these measures may imply that the effect of rising interest rates on bank NIMs may not be immediate. Instead, the value of MVPE that banks are losing to higher rates may not manifest in declining NIMs for a year or more.

The Olson data further illustrate that one of the most significant determinants of longer-term IRR is an institution's concentration in long-term assets. For the

**Chart 6**

Concentration In Long-Term Assets\* Is a Significant Interest Rate Risk Driver

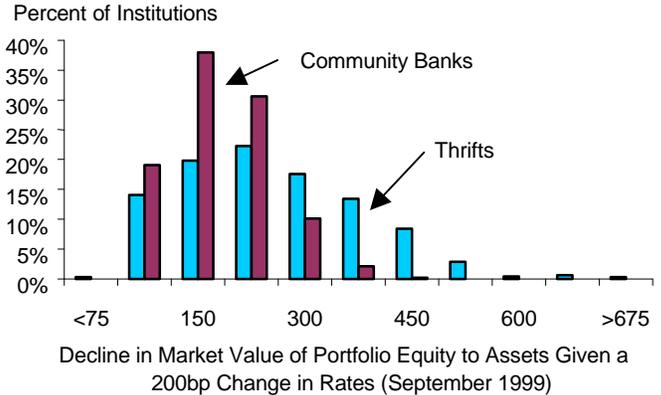


\*Assets with maturity or repricing frequency of greater than five years

Source: Olson Research Associates

**Chart 7**

Community Banks Continue to Display less IRR than Thrifts



Source: Olson Research Associates, Office of Thrift Supervision

more than 1,300 community banks modeled by Olson, the length of each bank's asset maturity structure is one of the most significant indicators of IRR. As shown in Chart 6, the amount of equity at risk to a 200-basis-point change in rates, an important indicator of longer-term IRR, has a strong positive correlation to a bank's ratio of long-term assets to assets.

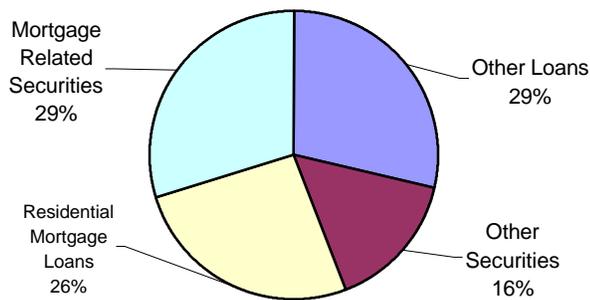
Despite the increasing IRR at community banks, thrifts still display more IRR than do banks. First, it appears that the interest rate sensitivity of banks has not increased as much as that of thrifts from year-end 1995 to midyear 1999. Over this period, the median sensitivity measure for thrifts rose 67 percent. In comparison, according to Olson's model, the median equity value at risk for community banks rose only 30 percent over the same period.

In addition, a comparison of the distributions of IRR across the two industries shows the thrift industry to be more vulnerable currently to interest rate movements. As of December 31, 1999, the median bank in the Olson universe had an OTS-comparable sensitivity measure of 133 basis points, compared with the median thrift, which had a measure of 182 basis points.<sup>19</sup> Chart 7 compares the distributions of IRR measures at community banks and thrifts and shows that the thrift industry has a higher percentage of institutions with more serious levels of IRR.

<sup>19</sup> The sensitivity measure is the decline in the MVPE from a 200-basis-point change in the yield curve as a percent of the present value of assets.

**Chart 8**

Over Half of Long-term Assets Are Residential Mortgage Related



Source: Call Report, Research Information System

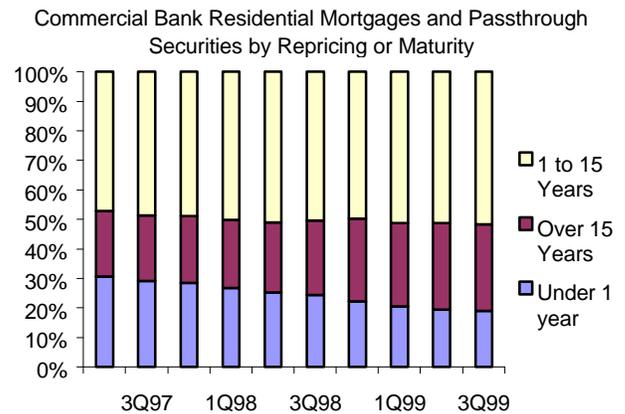
## Drivers of Industry Interest Rate Sensitivity at Commercial Banks

**Trends in Mortgage Origination.** Larger holdings of mortgages with longer maturities or repricing intervals have been a significant contributor to the lengthening average maturity of assets for the commercial banking industry. As shown in Chart 8, 57 percent of commercial banks' long-term assets are mortgage-related. Moreover, the percentage of mortgages and mortgage pass-through securities that have a maturity or repricing frequency of less than one year has declined at commercial banks in favor of mortgage-related assets that mature or reprice in over 15 years (see Chart 9).

The trend toward longer maturity assets was exacerbated by the characteristics of the 1998 refinancing boom. The flat yield curve that persisted through the second half of 1998 narrowed the rate differential between short- and long-term mortgages and boosted the popularity of long-term, fixed-rate mortgages. As a result, most mortgage borrowers opted for 30-year fixed-rate loans. In 1998, 25 percent of the 15-year fixed-rate mortgages refinanced were extended to 30-year fixed-rate mortgages, whereas during the last major refinancing boom (in 1993), only 8 percent extended to 30-year fixed-rate mortgages. Among consumers with adjustable-rate mortgages (ARMs) in 1998, 67 percent opted for 30-year fixed-rate mortgages. In contrast, in 1993, only 40 percent

**Chart 9**

Mortgage Exposure is Lengthening at Commercial Banks



Source: Call Reports, Research Information System

of consumers with ARMs converted to 30-year fixed-rate mortgages.<sup>20</sup>

To the extent that long-term mortgages underwritten in 1998 remain on the balance sheet of institutions, they may negatively influence NIMs for the next several years. Rates on long-term mortgages originated during 1998 were at historical lows. Consequently, it is likely that these mortgages will experience lower than normal prepayment rates, which will result in longer than normal weighted average lives.<sup>21</sup> Although more normal consumer preference for adjustable-rate mortgages returned in 1999 (28 percent of the mortgages originated in third-quarter 1999 were adjustable rate), large holdings of long-term mortgages originated in 1998 may be a depressing influence on NIMs for some time.

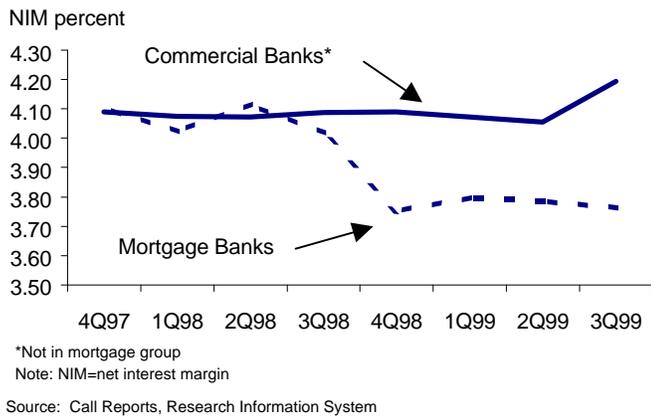
The potential for these mortgage market trends to affect NIMs is apparent from the recent performance of commercial banks specializing in mortgage lending.

<sup>20</sup> "Refinance Market of 1998 Looks Very Different From Refi Market of '93: 30-Year FRMs Rule," *Inside Mortgage Finance*, December 11, 1998.

<sup>21</sup> Weighted average life is defined as the weighted average time to the return of a dollar of principal. It is calculated by multiplying each portion of principal received by the time at which it is received, and then summing and dividing by the total amount of principal. Frank J. Fabozzi, *The Handbook of Fixed Income Securities*, 5<sup>th</sup> ed., 1997, p. 539.

**Chart 10**

Members of the Mortgage Bank Group's NIMs Have Deteriorated Disproportionately to Other Institutions



Banks at which more than 50 percent of assets are mortgage-related experienced a greater NIM decline than other banks in 1998. In addition, these mortgage specialists have not enjoyed NIM recovery in 1999 to the extent that other institutions have (see Chart 10).

**Funding Trends.** Lagging deposit growth has necessitated an increased reliance on volatile funding sources. Commercial banks' asset growth has outpaced their ability to raise deposits, forcing many institutions to turn to more expensive and market-sensitive funding sources. A measure of tightened funding at commercial banks is the loan-to-deposit ratio, which, at over 90 percent, reached an all-time high at the end of third-quarter 1999 (Chart 11). Trends in household wealth accumulation, higher yielding investment alternatives, and certain demographic shifts are among factors influencing this ratio.<sup>22</sup>

Greater reliance on potentially volatile funding tends to increase interest rate sensitivity by increasing an institution's liability sensitivity and duration gap. Currently, more than 80 percent of the volatile liabilities held by commercial banks mature or reprice in less than a year. Generally, retaining volatile liabilities at maturity requires paying current market rates, implying that if rates rise over the next year, banks will be facing a higher cost when trying to replace this funding.

<sup>22</sup> Brain Kenner and Allen Puwalski, FDIC, "Shifting Funding Trends Pose Challenges for Community Banks," *Regional Outlook*, Third Quarter 1999, pp. 11-17.

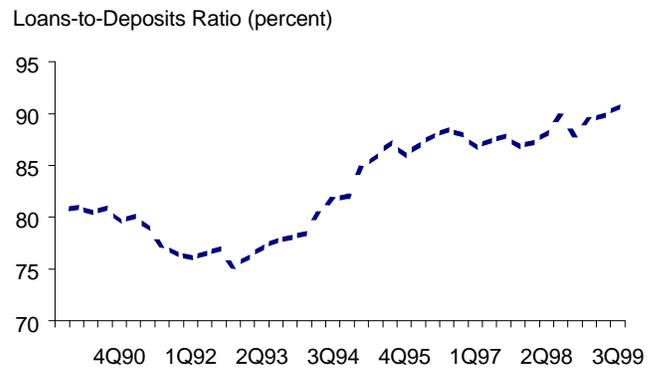
The complexity of some nondeposit funding sources also may affect interest rate sensitivity. For instance, some Federal Home Loan Bank advances, a major component of bank and thrift borrowings, may contain embedded options that require greater expertise and attention to policies and practices that, if not managed properly, could lead to undesirable outcomes if interest rates change adversely.

Another important consideration is the influence that recent funding trends may have on the repricing behavior of *deposit* funding. According to an OTS study, thrifts were able to retain nonmaturity deposits as rates rose in 1994, even though increases in the offered rates on their deposits lagged increases in market rates. Despite rising market rates, the cost of deposits remained relatively stable. Thrifts' ability to resist changing the rate paid on deposits muted the effect on their NIM from the over 250-basis-point rise in the Federal funds target rate that occurred during 1994.<sup>23</sup> Similarly, commercial bank NIMs were affected little by the rise in rates during 1994.

Liquid balance sheets and amenable depositors helped banks and thrifts to lag market rates when pricing deposits in 1994. The popularity of deposit alternatives with consumers and significantly tighter funding at banks currently, suggest that banks will find it more difficult than in 1994 to lag market rates when setting deposit rates. In 1994, loan demand had not been sustained over a long period, and, generally,

**Chart 11**

Bank Loan Demand and Slow Deposit Growth Are Straining Funding



<sup>23</sup> A Statistical Analysis of the Factors Affecting S&Ls' Net Interest Margins. Elizabeth Mays, Ph.D.

banks had sufficient liquid assets to convert to meet this demand. Sustained loan growth since then has resulted in less liquidity at banks generally. At the same time, consumers are more rate conscious and appear to be more aware of the potential opportunity costs of holding deposits, as evidenced by the greater use of deposit alternatives such as mutual fund investments. According to the **2000 ABA Community Bank Competitiveness Survey**, in response to funding pressures, some banks are changing their deposit pricing strategies. More than 42 percent reported a more aggressive deposit pricing strategy this year, compared to only 24 percent last year.<sup>24</sup>

These factors will likely cause increases in market rates to translate more quickly into higher funding costs. Funding pressure from sustained loan demand will force banks to either avert deposit runoff by paying market rates to increasingly rate-savvy customers or replace deposits with additional noncore funding sources at market rates.

Greater funding pressure and increasingly rate-conscious depositors may also affect the accuracy of IRR measurement systems. The results of different interest rate risk models could easily vary widely, depending on the assumptions applied to deposits.<sup>25</sup> Models such as Olson's apply assumptions derived from historical relationships contained in bank data and industry norms to estimate how much the value of deposits will vary with market rates.<sup>26</sup> If those historical relationships have changed to the detriment of management's ability to resist changing deposit rates in the face of rising market rates, liability sensitivity could be underestimated by current models.

## Trends in IRR Management

Banks do not appear to have responded to the trends that suggest increased IRR with increased efforts to

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<sup>24</sup> American Bankers Association, *ABA Competitiveness Survey Shows Community Bankers Concerns for Funding, Employee Recruitment and Technology Issues*, [http://www.aba.com/aba/pressroom/pr\\_022200survey.asp](http://www.aba.com/aba/pressroom/pr_022200survey.asp)

<sup>25</sup> Wright and Houpt, p. 123.

<sup>26</sup> "A/L Benchmarks Industry Report," Olson Research Associates Inc., First Quarter 1999.

manage this risk. Financial institutions can manage IRR on balance sheet by targeting the duration of assets and liabilities or off balance sheet with derivative products that offset their balance sheet positions.

**On-Balance Sheet IRR Management.** Managing IRR on balance sheet has been complicated by the trends noted in residential mortgage refinancing activity and bank funding. The effect of these trends on IRR may reflect that banks are constrained somewhat when managing loan and liability duration by the preferences of their customers.

The securities portfolio is a balance sheet category in which management theoretically retains significant flexibility for managing maturities. However, banks do not appear to be managing their securities portfolios to temper the lengthening average maturity of assets. By maintaining shorter durations in the securities portfolio, bank management could partially offset extending maturities in the loan portfolio. However, securities portfolios have been shrinking relative to assets because of strong loan demand. Furthermore, banks have been maintaining a heavy weighting in mortgage-related securities and other longer-term securities, which does not serve to offset the lengthening duration in the loan portfolio. The rapid decline in the value of securities held by banks as rates have risen suggests that duration in bank securities portfolios is increasing also. At the end of September 1998, bank and thrift securities portfolios contained net unrealized gains of \$16 billion. However, rising interest rates over the next 12 months dissipated these gains and, by September 1999, had contributed to unrealized losses of almost \$17 billion (Chart 12).

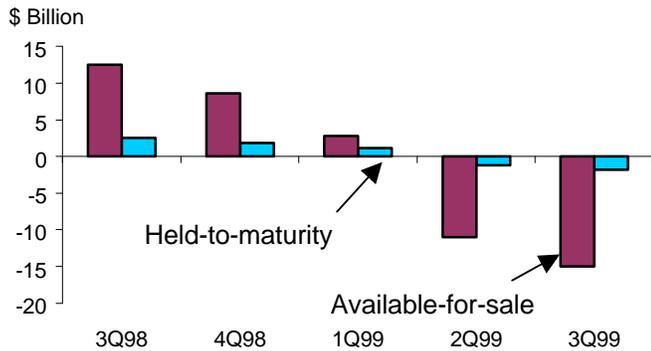
Furthermore, Olson indicates that the interest rate elasticity (IRE)<sup>27</sup> of the median securities portfolio of the banks they monitor rose from 2.50 to 2.83 from the first quarter of 1998 to the third quarter of 1999. If community banks were using their securities portfolios to offset extension in other balance sheet categories, the IRE would not be rising.

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<sup>27</sup> See footnote 10 on interest rate elasticity and Macaulay's duration.

**Chart 12**

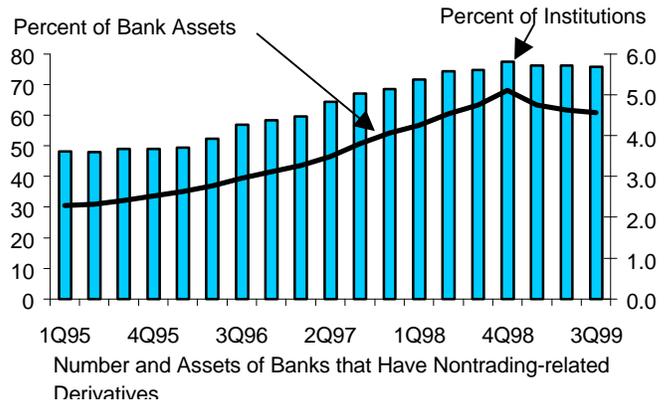
The Extension of Average Maturity in a Rising Rate Environment Is Resulting in Rapidly Depreciating Securities Portfolios for Commercial Banks



Source: Call Reports, Research Information System

**Chart 13**

Banks Appear to Have Curtailed Hedging Activities Since Year-end 1998



Source: Call Reports, Research Information Systems

**Off-Balance-Sheet IRR Management.** *Off-balance-sheet hedging activity also appears to be declining at commercial banks.* In addition to managing interest rate risk by restructuring the securities portfolio, IRR can be hedged off balance sheet in the futures or swaps market. However, as shown in Chart 13, after a long period of steady increase, both the percentage of banks and the percentage of assets held by banks that appear to be using derivatives to hedge IRR have declined.<sup>28</sup>

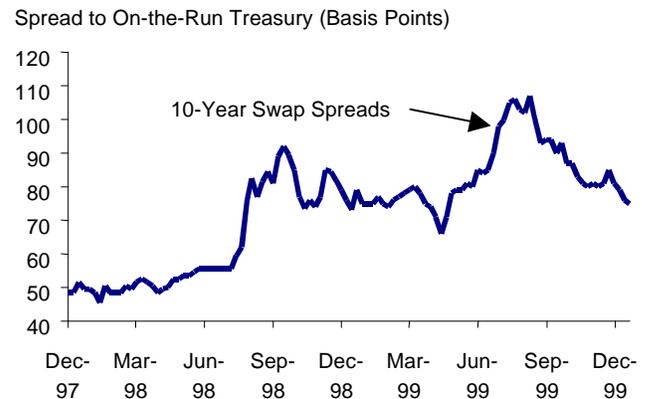
may have motivated more institutions to remain unhedged.

Several possible influences may have discouraged institutions from hedging before rates rose in 1999. The first is the dramatic widening of swap spreads that occurred in the fourth quarter of 1998 (see Chart 14). Hedging was made more expensive by historically wide quoted spreads on interest rate swaps at the end of 1998 that resulted because of marketwide preference for floating rates. Ten-year swap spreads, which were as narrow as 32 basis points in January 1997, widened to 94 basis points in late 1998. Swap spreads remained high through much of 1999. Swap spreads represent a major component of the cost of hedging, and the historically wide spreads that prevailed at the end of 1998 through much of 1999

**Financial Accounting Standards Board Statement 133.** A second factor reportedly discouraging hedging at some financial institutions is the pending implementation of Financial Accounting Standards Board Statement (FAS) 133.<sup>29</sup> FAS 133 may discourage hedging because it is likely that fewer derivatives will qualify for hedge treatment under the new statement. In addition, institutions may desire to avoid an increase in earnings volatility that many in the financial services industry believe will result because of FAS 133. An increase in reported earnings

**Chart 14**

Historically Wide Swap Spreads May Have Discouraged Hedging Before Interest Rates Rose in 1999



Source: Bloomberg Analytics

<sup>28</sup> While it is not possible to determine the extent of hedging activity from Call Report information, there are line items that serve as a proxy to identify institutions that may be using derivative instruments to hedge IRR. Institutions with assets greater than \$100 million report the impact on income of off-balance-sheet derivatives held for purposes other than trading, and all institutions report the notional amount of derivative contracts held for purposes other than trading. Nonzero amounts in either of these items can serve as a proxy for institutions that are likely engaged in some hedging activity

<sup>29</sup> Although implementation of the rule has been delayed until the fiscal year beginning after June 30, 2000, the decision to delay implementation was not made until May 19, 1999.

volatility could result for derivatives users because the standard requires that the changes in the value of the hedge that are not offset by changes in the value of the hedged item be recognized in current income. Additional earnings volatility could result because of potential differences between the accounting for a derivative and the instrument it hedges. Although derivative gains and losses will be reflected in current income, changes in the value of the hedged item—for instance, a bank's loan portfolio—may continue to be carried at book value because there is no generally accepted accounting procedure to account for loans at fair value.

There may also exist in FAS 133 an incentive for hedging firms to terminate their existing hedge positions to take advantage of current treatment that allows them to amortize the gain or loss over the life of the hedged item. After the new standard takes effect, some of these institutions may find the new standard too costly to implement and may not replace their old derivative contracts.<sup>30</sup>

## Summary and Conclusions

Several measures indicate that IRR is rising at community banks to a level that may warrant increased oversight. However, IRR remains higher at thrifts than at community banks. The trends toward lengthening assets and increased use of volatile liabilities are the primary drivers of recent increased IRR. In the aggregate, banks do not appear to be using their securities portfolios to reduce this risk, nor have they increased off-balance-sheet management efforts in response to riskier balance sheet structures. Institutions with excessive duration gaps may experience NIM compression if rates continue to rise. For community banks, which rely heavily on NIM as their main source of revenue, the combination of a large duration gap and rising rates could have a significant effect on net income.

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<sup>30</sup> For a more complete discussion of FAS 133, see Lisa Ashley, "Financial Accounting Standard No. 133—The reprieve," *Chicago Fed Letter*, July 1999, Issue 143, pp. 1, 3.